fecting individuals' susceptibility is not clear.[6]

Only one of 32 (3%) serogroup C organisms isolated in California and isoenzyme-typed at CDC between 1980 and 1985 was type ET22. Los Angeles County was the first area of the United States to experience an increase in disease due to this meningococcal strain. However, a small cluster of cases of the same ET type occurred simultaneously in Tennessee.[4] Outbreaks of serogroup C have since been documented in Washington State, Texas, and Canada.

Circulating strains of *N meningitidis* were resistant to sulfadiazine and sensitive to rifampin. Physicians in Los Angeles County were notified of the epidemic[7-9] and advised to administer rifampin to household, jail, and day care contacts of case patients and to consider immunizing high-risk patients, including children 2 through 4 years of age, with quadrivalent meningococcal vaccine. However, the relatively high cost of the vaccine for civilians ($10.00/dose in 1987, in contrast with the estimated military cost of $2.00/dose) limited the usefulness of the vaccine in controlling the epidemic. □

J. Conley Thomas, PhD, MPH
Nancie S. Bendana, MS
Stephen H. Waterman, MD, MPH

Requests for reprints should be sent to J. Conley Thomas, PhD, MPH, Department of Epidemiology, CB# 7400, McGavran-Greenberg Bldg, School of Public Health, University of North Carolina, Chapel Hill, NC 27599-7400.

References

1. *Communicable Disease Annual Report.* Los Angeles, Calif: Los Angeles County Department of Health Services; 1986:76.
2. Thomas JC, Bendana N, Waterman S, et al. Risk factors for carriage of meningococcus in the Los Angeles County men's jail system. *Am J Epidemiol.* 1991;133:286–295.
3. Wenger JD, Hightower AW, Facklam RR, Gaventa S, Broome CV, and the Bacterial Meningitis Study Group. Bacterial meningitis in the United States, 1986: report of a multistate surveillance study. *J Infect Dis.* 1990;162:1316–1323.
4. Pinner RW, Gellin BG, Bibb WF, et al. Meningococcal disease in the United States, 1986. *J Infect Dis.* 1991;164:368–374.
5. *Communicable Disease Annual Report.* Los Angeles, Calif: Los Angeles County Department of Health Services; 1981–1985 editions.
6. Griffis JM. Epidemic meningococcal disease: synthesis of a hypothetical immunoepidemiologic model. *Rev Infect Dis.* 1982;4:159–172.
7. Los Angeles County Department of Health Services. Meningococcal disease in Los Angeles County, winter 1986–87. *Public Health Lett.* 1987;9:5–6.
8. Los Angeles County Department of Health Services. Meningococcal disease alert. *Public Health Lett.* 1987;9:43.
9. Los Angeles County Department of Health Services. Meningococcal disease update. *Public Health Lett.* 1988;10:2.

Changing HIV Risk Behaviors: The Case Against Pessimism

Four articles[1-4] in the November 1992 Journal addressed the increasingly urgent question of how women should be counseled to reduce their risk for sexually transmitted diseases, including infection with the human immunodeficiency virus (HIV). Three articles concluded that spermicides should be recommended to women as a fallback prevention method when condoms are not acceptable to one partner or both partners, and all stressed the need for female-controlled prophylactic methods, betraying a distinct pessimism about the ability of women to reduce their risk by insisting on condom use.

Two corollaries of this pessimism are of concern to us: first, recommending an HIV prevention strategy of unknown efficacy and safety—spermicides—and, second, giving short shrift to behavioral prevention strategies. We will address the second, because concerns about the potential harmful effects of spermicides and the case for the efficacy of condoms over spermicides for HIV prevention have already been presented in the literature.[2,5,6]

Pessimism about behavioral change diverts our attention from behavioral strategies to technological solutions. Unfortunately, women are at risk now, and an adequate technological solution may be a long way off. Further, a female-controlled method does not necessarily change the social and sexual environments that constrain women's access to, attitudes toward, and actual use of disease prevention or pregnancy prevention methods. (For example, since the appearance of the birth control pill, we have had an accessible female-controlled method of contraception. Still, in the United States every year, an estimated 35% of births are unwanted or mistimed and approximately 1.4 million pregnancies end in induced abortion).

Is this further cause for pessimism? We think not. The last 10 years have witnessed the rapid acceleration of research—spurred by the acquired immunodeficiency syndrome (AIDS) epidemic—on women's sexual, contraceptive, and disease prevention behavior.[7-13] Looking to that research, we see cause for optimism. For example, the research shows that perceived norms exert considerable influence on sexual behavior.[7-10] However, both qualitative and quantitative studies suggest that, even in the absence of normative support for condom use, women are not powerless in their sexual relationships with men. Inner-city women interviewed in drug treatment reported leaving relationships with men whom they considered unreliable or poor role models for their children.[11] Even in countries characterized by profound gender inequality, male attitudes towards condom use can be changed, and women can acquire the skills and confidence to use condoms effectively.[12]

Although condoms' social and cultural connotations can be formidable barriers to use,[13] cultural influences that are perceived by public health workers as barriers (such as pressure for women to protect their male partners) may also facilitate use.[9] Further, social conventions can be changed: media, culturally sensitive service providers, and peer educators can create new behavioral norms, and additional barriers to condom use could be eliminated through careful planning and targeted intervention.[14]

We must not let pessimism about men's and women's ability and desire to change their behavior continue to haunt our prevention efforts. Although we support the development of female-controlled disease prevention methods, we believe the public health field needs to aggressively pursue research in the behavioral as well as the biomedical domain if we hope to prevent the spread of HIV in women. □

Christine Galavotti, PhD
Carolyn Beeker, PhD

At the time this letter was written, both authors were with the Division of STD/HIV Prevention, National Center for Prevention Services, Centers for Disease Control and Prevention, Atlanta, Ga.

Requests for reprints should be sent to Christine Galavotti, PhD, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, MS K-34, Atlanta, GA 30341-3724.

References

1. Rosenberg MJ, Gollub EL. Commentary: methods women can use that may prevent sexually transmitted disease, including HIV. *Am J Public Health* 1992;82:1473–1478.
2. Cates W, Stewart FH, Trussell J. Commentary: the quest for women's prophylactic methods—hopes vs science. *Am J Public Health.* 1992;82:1479–1482.
3. Stein ZA. Editorial: the double bind in science policy and the protection of women

from HIV infection. *Am J Public Health.* 1992;82:1471–1472.
4. Ehrhardt A. Trends in sexual behavior and the HIV pandemic. *Am J Public Health.* 1992;82:1459–1461. Editorial.
5. Kreiss J, Ngugi E, Holmes K, et al. Efficacy of nonoxyl-9 contraceptive sponge use in preventing heterosexual acquisition of HIV in Nairobi's prostitutes. *JAMA.* 1992;268:477–482.
6. Stone KM, Peterson HB. Spermicides, HIV, and the vaginal sponge. *JAMA.* 1992; 268:521–523.
7. Centers for Disease Control. Heterosexual behaviors and factors that influence condom use among patients attending a sexually transmitted disease clinic—San Francisco. *MMWR.* 1990;39:685–689.
8. Valdiserri RO, Arena VC, Proctor D, Bonati FA. The relationship between women's attitudes about condoms and their use: implications for condom promotion programs. *Am J Public Health.* 1989;79: 499–501.
9. Kline A, VanLandingham M. Determinants of condom use among HIV-infected women in New Jersey. In: Program of Abstracts, Eighth International Conference on AIDS; July 19–24, 1992; Amsterdam, the Netherlands. Abstract PoD 5211.
10. Abdul-Quader AS, Tross S, Silvert HM, et al. Peer influence and condom use by female sex partners of injecting drug users in New York City. In: Program of Abstracts, Eighth International Conference on AIDS; July 19–24, 1992; Amsterdam, the Netherlands. Abstract PoD 5489.
11. Kline A, Kline E, Oken E. Minority women and sexual choice in the age of AIDS. *Soc Sci Med.* 1992;34:447–457.
12. Allen S, Serufilira A, Bogaerts J, et al. Confidential HIV testing and condom promotion in Africa. *JAMA.* 1992;268:3338–3343.
13. Kenen RH, Armstrong K. The why, when and whether of condom use among female and male drug users. *J Community Health.* 1992;17:303–317.
14. O'Reilly KO, Higgins DL. AIDS community demonstration projects for HIV prevention among hard-to-reach groups. *Public Health Rep.* 1991;106:714–720.

Measuring HIV-1 Seroprevalence among English Newborns: Blood Spot Size

In "Improving Estimates of HIV-1 Seroprevalence among Childbearing Women: Use of Smaller Spots," Hoxie and his colleagues report a substantial failure to include eligible, residual, neonatal dried blood-spot specimens in a US survey of human immunodeficiency virus (HIV) infection among child-bearing women.[1] Following a protocol that required the use of a single 1/4-in. (6.4-mm) diameter circular blood-spot disk (area 31.7 mm^2), the group reported that 4.8% of 154 683 eligible specimens had insufficient areas of blood spot (termed "quantity not sufficient" [QNS]), although by taking multiple small (1/8-in/3.2-mm) disks they found it possible to gather the required area of specimen in the majority of samples, reducing the QNS proportion to 0.52%. Surprisingly, the group also reported that HIV-1 seroprevalence was three times higher among the specimens derived from multiple small spots compared with the single large spots. This difference just reached statistical significance at the odds ratio's 95% confidence interval (1.2, 7.4).

If replicated elsewhere, such a finding would be of concern, because unlinked anonymous dried blood-spot surveys employ specimens residual to those used in screening for inborn deficiencies such as phenylketonuria. In our experience in the United Kingdom, it is common not to find enough dried blood residuum to produce a single disk as large as 31.7 mm^2, and so a substantial QNS proportion would be inevitable if such a single spot were used.

In a survey coordinated by the Public Health Laboratory Service in England, from January to December 1992, a total of 99 041 neonatal specimens were found eligible for unlinked anonymous sampling. Two hundred and twenty were found to be insufficient for testing; thus the QNS proportion was 0.22% (220/98 700) after the subtraction of 121 mothers who objected to their babies' blood being used for unlinked anonymous testing. When the remainder were tested, 47 were confirmed HIV-1 antibody positive (seroprevalence 0.0476%). The criteria for QNS was inability to cut a blood spot or spots equivalent to a 3-mm diameter spot. Even if the seroprevalence in the QNS samples were 7.4 times higher, this would mean missing only an additional $220 \times 0.00048 \times 7.4$ positives (= 0.78) and would still imply an actual seroprevalence among the eligibles of 0.0483% ([47 + 0.78]/[98 700 + 220]). Hence, at this low QNS proportion any effect on the measured seroprevalence is trivial.

In the United Kingdom's neonatal surveys, very low QNS proportion is achieved through the use of anti-HIV tests (GACPAT and MAT) that are modifications of a commercially available particle agglutination assay (Serodia-HIV).[2,3] Both are economical and can use either a 3-mm or a 5-mm diameter disk.[4] We investigated whether eluates from such disks contain sufficient immunoglobulin G (IgG) to sustain high sensitivity. Eluting from 203 5-mm diameter dried blood spots with 200 µl buffer, we found a minimum IgG concentration of 19 mg/l (median and maximum values 57 and 110 mg/l, respectively), and, because the GACPAT assay will detect IgG anti-HIV in specimens with as little as 1 mg/l total IgG, 3-mm disks (which will contain one third of the specimen in a 5-mm disk) will also give enough material for testing. Support for this view comes from titrations of anti-HIV positives. In our experience with the GACPAT, the minimum titer from dried blood spots has been 1 in 800 and is usually tenfold higher. □

Christine McGarrigle
John Parry
Angus Nicoll

Christine McGarrigle and Angus Nicoll are with the Communicable Disease Surveillance Centre, and John Parry is with the Virus Reference Divisions, Public Health Laboratory Service, London, England.

Request for reprints should be sent to Christine McGarrigle, Public Health Laboratory Service, Communicable Disease Surveillance Centre, HIV & STD Division, 61 Colindale Ave, London, NW9 5EQ, England.

References

1. Hoxie NJ, Vergmont JM, Pfister JR, Hoffman GL, Markwardt-Elmer PA, Davis JP. Improving estimates of HIV-1 seroprevalence among childbearing women: use of smaller spots. *Am J Public Health.* 1992;82: 1370–1373.
2. Barbara JAJ, Salker R, Challis P, Contreras M. Gelatin particle agglutination assay for HIV antibodies: a rapid economical modification with increased sensitivity. *Med Lab Sci.* 1989;46:135–140.
3. Parry JV, Mortimer PP. Immunoglobulin G antibody capture particle adherence test (GACPAT) for antibody to HIV-1 and HTLV-1 that allows economical large scale screening. *AIDS.* 1989;3:173–176.
4. Parry JV, Mortimer PP, Nicoll A. Performance assessment of neonatal dried blood spot testing for HIV antibody. *Commun Dis Rep.* 1992;2:R128–R129.

HIV and Trends in Cervical Cancer Death Rates among Young Women

In "The Reporting of HIV/AIDS Deaths in Women," Buehler et al. examined death rates for human immunodeficiency virus (HIV) infection and associated conditions in order to assess the impact of the HIV epidemic among women 15 through 44 years of age.[1] One conclusion from this analysis was that the HIV epidemic had not yet had a demonstrable impact on cervical cancer mortality, based on two observations: (1) trends in cervical cancer deaths were similar in states with high or low incidences of acquired immunodeficiency syndrome